

September 22, 2003

Mr. Richard Sprott, Director
Division of Air Quality
Utah Department of Environmental Quality
P.O. Box 144820
Salt Lake City, UT 84114-4820

Attention: Milka Radulovic, New Source Review Section

Dear Director Sprott,

NOTICE OF INTENT: Additional Information Submittal

On September 23, 2002, Intermountain Power Service Corporation (IPSC) submitted a notice of intent (NOI) to make certain changes at the Intermountain Generating Station (IGS) near Delta, Utah. As part of the permitting process, IPSC installed and tested an over fire air system for NOx control under the authority of an experimental Approval Order (AO) DAQE-AN0327012A-03 issued by the Division of Air Quality (DAQ). The Intermountain Power Service Corporation (IPSC) is hereby submitting the results and analyses of the testing so that final approval and permitting may proceed.

BACKGROUND

IPSC's NOI requested, among other things, approval to install over fire air (OFA) to control nitrogen oxides (NOx) emissions. IPSC has found that due to changes in overall fuel quality, it is likely that additional NOx control such as OFA is needed to meet permit conditions for continued long term operation. Since OFA operation may cause carbon monoxide emissions to increase by a net significant amount when NOx emissions are minimized, IPSC sought approval to install OFA under Prevention of Significant Deterioration (PSD) requirements. PSD specifies the criteria under which OFA may be installed and operated with no adverse impact to air quality.

As part of making a PSD determination, it was necessary to perform a demonstration project on OFA operation. On February 5, 2003, IPSC submitted a Notice of Intent requesting approval to install and test an over fire air (OFA) system on Unit 1 for NOx control. Testing results are intended to be used to establish permitting parameters for installing another OFA system on Unit 2 and to demonstrate PSD compliance with the full time operation of both systems.

OFA DEMONSTRATION PROJECT TEST SUMMARY

The OFA was installed and tested to ascertain the operating characteristics and environmental aspects of good combustion practice that minimizes carbon monoxide (CO) emissions while simultaneously controlling NOx emissions. It was expected that the use of OFA could increase CO emissions by a net significant amount (100 tons per year) as NOx emissions are minimized. The results of the testing will help DAQ and the IPSC to determine permit conditions that

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represent the Best Available Control Technology (BACT) for CO when the OFA is utilized.

OFA was installed in the Unit 1 boiler during its Spring outage. Initial operation of the OFA system upon restart of Unit 1 was problematic in as much as impacts to air flow within the boiler were significantly disrupted. It took significant time and effort to troubleshoot and pinpoint the causes, which included both mechanical breakdown and uneven fuel and air flows.

Once the causes were identified and corrected, tuning began for the OFA system to operate satisfactorily pursuant to its design. Once the OFA system performance was optimized, IPSC performed environmental testing to identify specific emission characteristics in various states of operation. That testing occurred September 6 - 9, 2003, and all testing data, along with pre-construct test data, are included with this report. Pre-construct testing occurred prior to the Spring outage when OFA was installed in order to obtain baseline information.

Certain expected operating parameters have not been achievable as yet. Specifically, combined full open 1/3 and 2/3 damper position (full port operation) has not yet been attainable with proper boiler and emissions control. IPSC intends to continue to work on this problem and perform intermittent OFA test operation. It is expected, however, that 2/3 open damper is the most likely long term operating condition for the over fire air system.

A full test report is included with this letter, along with copies of the original NOI request, the experimental approval order, the test report required by that AO, and a compliance assurance monitoring (CAM) plan applicable to CO.

OFA DEMONSTRATION PROJECT TEST RESULT OVERVIEW and ANALYSIS

The results of the testing are included with this letter. In analyzing the data, IPSC finds that the single best parameter that correlates most with CO emissions is percent O₂ in the boiler exit flue gas. As shown by the attached charts, CO concentration can be determined by percent O₂ based upon specific operating conditions of the over fire air system.

A relationship formula has been derived for each curve based upon best fit analysis of test data. OFA operating condition can be distinctly identified based on damper status. Thus, the tables represent No OFA, 1/3 open OFA, 2/3 throttled OFA, and 2/3 open OFA operation. CO concentration curves are represented for each table and are related to percent O₂ generally as:

$$[C_{\text{ppm}}] = n * (O_2\%)^a,$$

where; $[C_{\text{ppm}}]$ = concentration of CO in parts per million;
n = curve specific factor;
O₂% = percent O₂ measured at boiler exit;
a = curve specific exponent.

CO BACT & RECOMMENDED PERMIT CONDITIONS

If you require any further information concerning the testing of OFA or issues tied to this approval order, please contact Mr. Dennis Killian, Superintendent of Technical Services at IPSC, at 435-864-4414, or dennis-k@ipsc.com .

Cordially,

George W. Cross
President and Chief Operations Officer

BP/RJC/jmg

cc: Blaine Ipson
Lynn Banks
Jerry Hintze
Eric Tharp, LADWP

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